IRON GOAT TRAIL


Volunteers for Outdoor Washington


FOREST SERVICE
US
DEPARTMENT OF AGRICULTURE

THE IRON GOAT TRAIL

A GUIDEBOOK

Volunteers for Outdoor Washington:
Organized 1982 ". . .to promote volunteer stewardship of Washington's outdoor recreation and natural resources in partnership with land management agencies."

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THE TRAIL'S BEGINNING

When you walk along the Iron Goat Trail, you follow an abandoned Great Northern Railway grade, rich in history and scenic beauty. You can walk this route today thanks to the vision of Volunteers for Outdoor Washington and the U.S.D.A. Forest Service. In 1987 they joined forces, and, with the cooperation of others, turned the idea for a trail into reality. It's now one of the landmarks within the Stevens Pass Historic District.

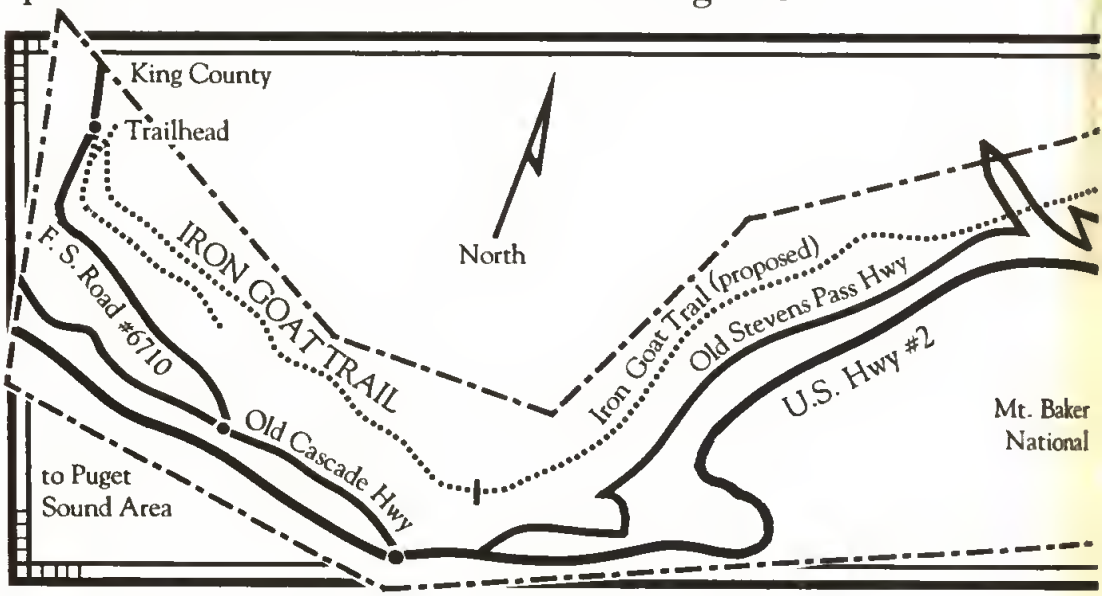
It took five years of background work before trail construction began. During that time Volunteers for Outdoor Washington built support for the project and compiled historical information. They bushwhacked possible trail locations and created an access route through fallen timber and avalanche debris that had accumulated over 60 years.

With the help of the Washington Native Plant Society and the Seattle Audubon Society, Volunteers for Outdoor Washington helped evaluate the trail's environmental consequences by identifying the plants and birds found along its way. Before the first shovel was lifted to build the actual trail, volunteers had already donated 374 days of field work and countless hours in project coordination and historical research.

In 1992, trail construction began. Two hundred and eighty-one volunteers worked a total of 580 days, clearing the route, building

retaining walls, and installing culverts under the direction of the Forest Service. In 1993, volunteers spent 700 days building trestles, bridges, waterbars, retaining walls, spur trails, and viewpoints needed to complete the trail's first phase.

The complex first phase, including far-reaching efforts from an archaeological dig to clearing avalanche debris, cost in the order of three-quarters of a million dollars. Funding was



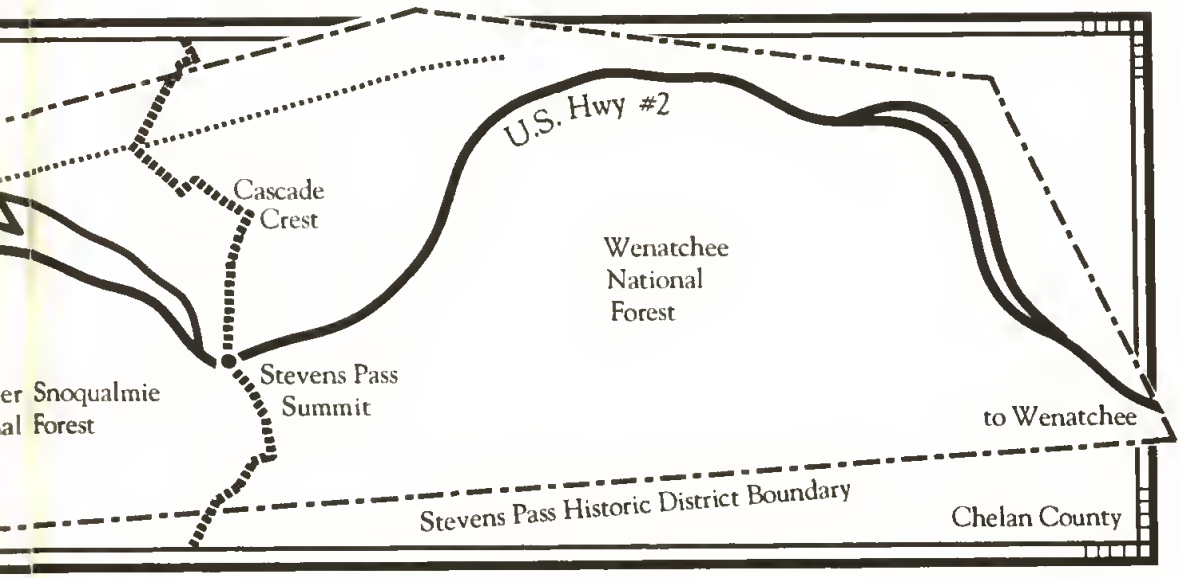
provided approximately as follows: 40% USDA Forest Service, 15% Washington state, 15% private sources, and 30% volunteer labor. Volunteers were involved in all areas of the project: planning, survey and design, construction, archaeology, interpretation, historical research and project coordination.

Thanks to teamwork among the many volunteers, organizations, and government agencies, the initial four miles of the trail were

ready for dedication in 1993—one hundred years after the first Great Northern train crossed the Cascades.

Getting There

To reach the trail from the **Puget Sound Area:**
* Drive east on the Stevens Pass Scenic Byway, U.S. Highway 2, to Milepost 55, six miles beyond the town of Skykomish.



* Turn left onto the Old Cascade Highway, U.S. Forest Service (USFS) Road #67.
* Proceed 2.3 miles to the junction with USFS Road #6710.
* Turn left and proceed 1.4 miles to the trailhead parking.

From **Wenatchee** and **points east:**
* Drive west on Stevens Pass Scenic Byway, U.S. Highway 2, to Milepost 58.4 at Scenic, which is 5.5 miles west of the summit of Stevens Pass.

* Turn right on the Old Cascade Highway, USFS Road #67.
* Descend 1.4 miles to the junction with USFS Road #6710.
* Turn right and proceed 1.4 miles to the trailhead parking.

The parking lot at the trailhead accommodates 20 cars. Toilets are available.

Miles of Options

The trail now consists of a 2.4 mile Upper Grade and a 1.2 mile Lower Grade. As shown on the map (pp. 30-31), the Upper and Lower grades are linked at two points via short trails referred to as the Martin Creek and the Corea crossovers. You can travel as far as 6.75 miles.

The wide, nearly level Lower Grade is barrier free, having a compacted crushed aggregate surface. The distance from the trailhead to the end of the Lower Grade is 1.2 miles downhill at a 2.2 percent grade.

Using the trail

This trail is a day-use site for hikers only. Please help us ensure that your visit is a safe one and that the area is preserved for generations to come:
* Pick up litter, but leave flowers, rocks, and historic artifacts in place, so that others may enjoy them also.

* Stay on the trail, out of the tunnels, and off the old timbers which are prone to collapse.
* Please respect the private property. The trail right-of-way is on federal property, but the surrounding areas include some private property.
* If you plan to visit the trail in winter, check the avalanche conditions first.

This guidebook is intended to enrich your understanding of the trail's history and to describe some of the features you'll encounter. If you see other features you'd like described in the next edition, want information about other trails, or see any harmful activity, please contact one of the following:
* Skykomish Ranger District, (206 677-2414 or 206 744-3260)
* Lake Wenatchee Ranger District, (509 763-3103);
* Mt. Baker-Snoqualmie National Forest Supervisor's Office, (206 775-9702); or
* Outdoor Recreation Information Center, (206 220-7450 for information about other trails).

THE TRAIL'S HISTORY

Special Collections, U of W Libraries - Pickett #3034

In the Path of a Giant

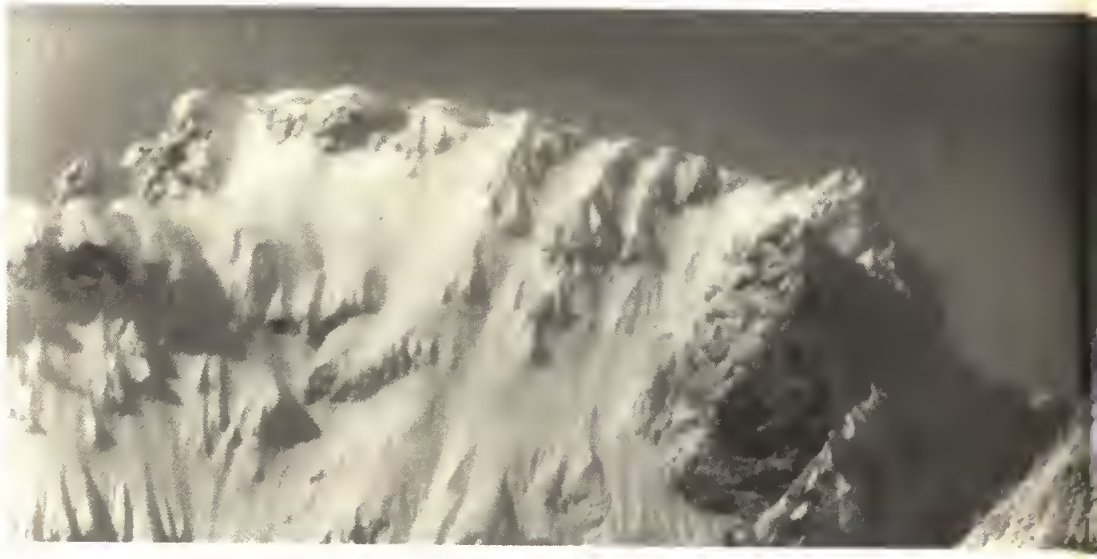
When you walk the Iron Goat Trail listen for the rumbling of trains passing in the distance. Those trains operate on a track belonging to a direct descendant of the Great Northern Railway, Burlington Northern. The route beneath your feet was once part of the Great Northern's line.

Here, hundreds of immigrants labored to cut giant trees, drill and blast rock, and create a flat place on the face of the mountain for the railway line. The Great Northern abandoned this section in 1929 with the completion of a 7.8 mile tunnel, one of several improvements made in the quest for efficiency.

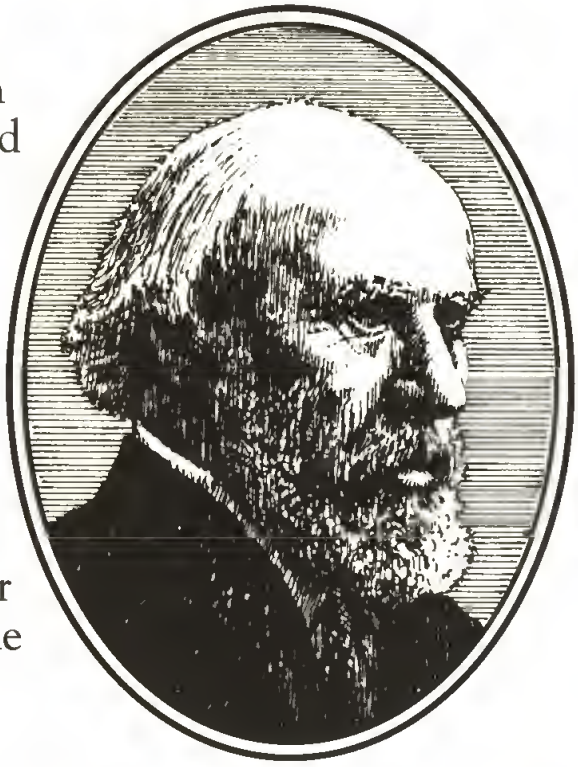
The story of the Great Northern Railway is a story of vision, ambition, perseverance, and sweat. It's largely the story of James J. Hill, a shrewd man known as the Empire Builder, and of the thousands of people who toiled to make his vision a reality.

The Empire Builder

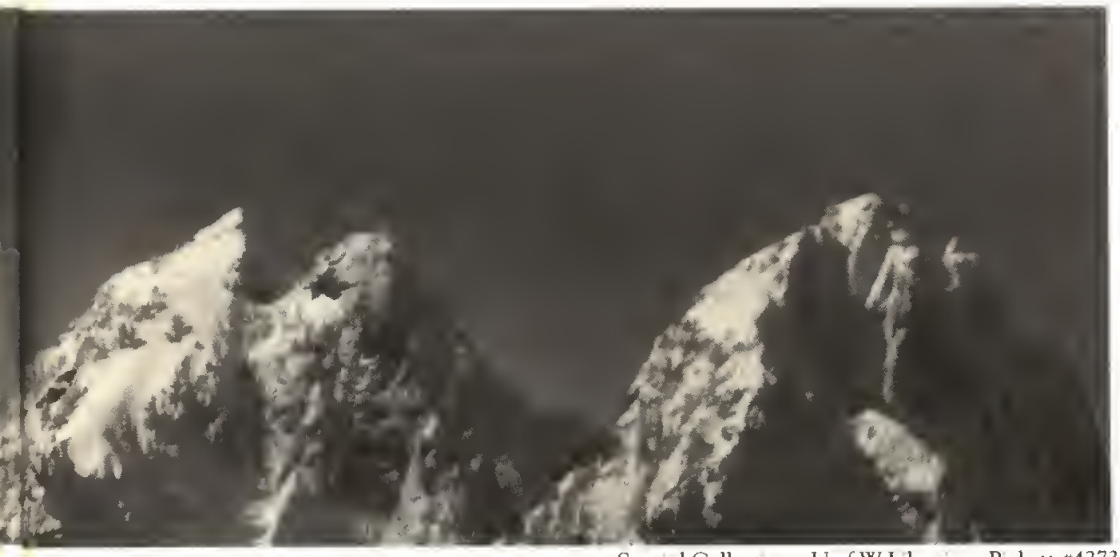
Born in a small town in Canada, James J. Hill came to St. Paul, Minnesota in 1856, at the height of the riverboat era. He foresaw that railroads would replace riverboats and horse-drawn wagons as a way to link the country's vast lands and to connect with ports for overseas trade.



In 1878, after building up wealth in the steamboat business and as a freight agent and coal dealer, Hill joined with others to buy the bankrupt St. Paul and Pacific Railroad. Through a series of additional acquisitions, Hill formed the Great Northern Railway in 1889 with a vision of reaching thePacific Coast.



The rival Northern Pacific Railroad had already crossed the Cascades by 1888, crossing at Stampede Pass. This spurred Hill's competitive instincts, and his push west began in 1890, one year after Washington became a state.



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Crossing the Mountain Wilderness

Crossing the Cascades posed a serious challenge, due to the rugged terrain. The discovery of a route across the mountains—"Stevens Pass"—is one of the Great Northern's many legacies. The pass is named for John F. Stevens, the man hired by the Great Northern to find a way over the Cascades after he had found an easy route over the Rockies, Marias Pass. His assistant, Charles Haskell, carved the name "Stevens Pass" in a tree after following Steven's lead to a low spot along the Cascade crest.

But Stevens Pass was much steeper than Marias Pass, and crossing the Cascades proved the hardest part of the Great Northern's route.

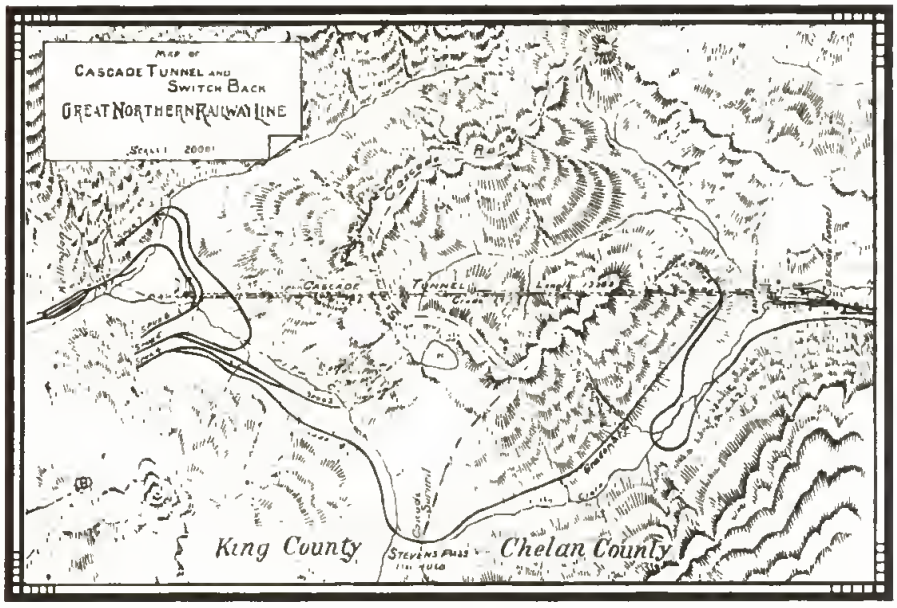
Hill viewed nature as something to overcome and ordered his engineers to build "the shortest and best line." However, the best way to cross

Stevens Pass was to tunnel about two and one half miles through nearly solid granite. Hill couldn't yet justify the time and cost for the tunnel.

Instead, the Great Northern built a series of switchbacks, five on the west side of the Cascade crest and three on the east side. Twelve miles of track connected the proposed Cascade Tunnel Station with Wellington, just three miles apart along a straight line.

A Laborious Ride

Imagine those early winter crossings over the Cascades. Snow could be piled as high as 25 feet on either side of the tracks, creating an icy canyon that muffled sounds. Sometimes snow slides trapped trains for days at a time, until snow plows and hundreds of men could shovel the way clear.



At best, a passenger train took an hour and a quarter to go what was just three miles as the crow flies. Passengers found themselves traveling forward and then backward; at the end of each switchback the train pulled into a spur, and the engine at the opposite end of the train became lead.

Above Wellington, the engine strained to pull the train along grades as steep as four percent. The effort required by the locomotive was about 25 times what was required to pull a full load on the level. A typical Great Northern steam engine of the early 1900s had a pulling force of 48,600 pounds which enabled it to pull a train of 18 freight cars with a total train weight of over 500 tons up the 4% grade.

The ride became notorious, and the switchbacks were dubbed "Death Mountain." But, there is no record of fatalities along the high-elevation switchbacks. Despite the difficult trip, the ride was smooth enough that passengers could still receive meal service in the dining car, complete with elegant glassware and linens on the table.

A Short Cut Through the Mountains: The First Cascade Tunnel

In 1896, a profitable year for the railway, Hill gave orders to pursue building a tunnel to replace the 12 miles of switchbacks. In 1897, just four years after its Pacific extension was

complete, the Great Northern began to bore a tunnel through the mountains.

It took three years and 600 to 800 men working shifts around the clock, seven days a week, before the 2.6 mile tunnel was complete. Construction was a challenge. At the west end, the ground was so heavy with water that it took three concentric sets of support timbers to keep the tunnel from caving in.

The completed tunnel was one of the Great Northern's engineering feats. The survey proved so accurate, that when the middle of the tunnel was bored through from either side, the two sides were almost perfectly aligned.

The tunnel eliminated the switchbacks at the mountain crest, but created problems of its own. The long, narrow tunnel trapped the hot, coal-fired engine exhaust. Train wheels slipped on the moist, soot-covered rails; this slowed speeds on up-hill trains, making the problem worse. Temperatures climbed as high as 200 degrees in the locomotive cabs, and several crew members died from the carbon-monoxide-rich smoke.

A major disaster was barely averted in 1903. Exhaust knocked the engine crew unconscious while they tried to fix a problem that had the train stopped within the tunnel. An alert railway fireman riding as a passenger released the brakes, and the train coasted to safety with

the crew and most of the 103 passengers unconscious.

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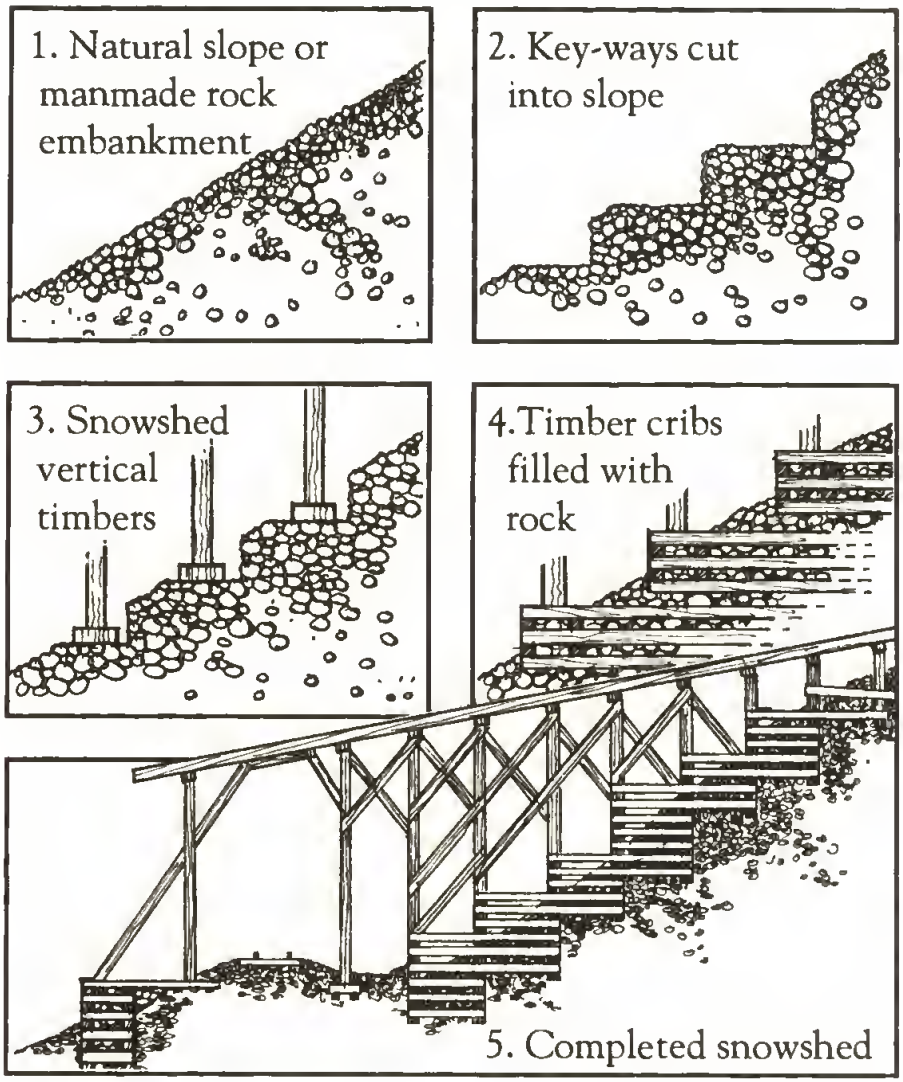
Members of the press lambasted Hill for conditions in the tunnel. Finally, in 1909, the tunnel was equipped with electric power in order to eliminate the hazardous exhaust. Four electric locomotives were in service to pull trains through the tunnel along three miles of trolley line. The three-phase electrification system, which allowed the engines to use power when traveling uphill and generate power when going downhill, was the first and only such system in an American railroad tunnel.

Continued Danger

Crossing the Cascades remained the most challenging leg of the Great Northern's route. When the pass was first located, the dense forest on the mountain hillside showed few signs of avalanches. That soon changed.

Logging, grade construction, and subsequent fires created an unstable, denuded landscape that was prone to avalanches. The early years of the Great Northern's Cascade operations coincided with a period of heavy snowfall which also increased the avalanche danger.



In 1893, the same year its first train rolled into Everett, the Great Northern built its first snowshed. Eventually snowsheds and tunnels covered about 75% of the track from Scenic upgrade to Wellington.

All the early snowsheds were built with timber. Much of the wood was from Douglas-fir, hemlock, and Pacific silver fir cut nearby. The uphill snowshed wall, comprised of timber cribbing, held back the earth. Additional cribbing braced the outer edge of the snowshed. More timbers formed the sloped roofs, which formed a continuous line with the mountain side so that any snow slides would be carried downhill without touching the tracks.

At the start of 1910, 17 separate snowsheds protected a total length of 7,593 feet, but much of the route was exposed. That spring an avalanche swept two unprotected trains down the mountainside near Wellington, killing 96 people.

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The Great Northern responded by building more and longer snowsheds which brought new troubles, trapping smoke and hindering visibility. The snowsheds, which became tinder dry in summer, were at risk of catching

fire from sparks from passing trains. To address the fire hazard, the Great Northern built two systems to collect and pipe water to many of the sheds.

Troubles continued. Heavy snows in the winter of 1912-13 crushed some of the older snowsheds, and the need for replacement and additional sheds was clear. In subsequent construction periods, the Great Northern built many snowsheds of wood and concrete, similar to the all-timber designs but with reinforced-concrete back walls. Two shed segments built entirely of reinforced-concrete had been built in 1910 and 1911, but the all-concrete designs proved too expensive.

The less expensive, all-timber snowsheds continued to be built as well as those of wood and concrete combined. New and rebuilt timber snowsheds were designed with removable outer shutters to let in light and air and to create views for passengers in the summer.

Meanwhile, the Great Northern began to study the possibility of building a longer tunnel further down the mountain. Plans were shelved with the outbreak of World War I.

The Great Northern built its last snowshed in this area during 1917. In early 1918, gushing water and mud slides from early snow melt caved in snowshed walls. When the Great

Northern undertook repairs in 1918, the cost of timber was triple what it had been just eight years earlier. Maintenance costs continued to climb.

Lower and Longer: The Second Cascade Tunnel

In 1921, the Great Northern resumed its plans for a second tunnel in order to abandon the troublesome stretch of line between Cascade Station and Scenic. Construction began in late December of 1925 and continued at a record-breaking ppace. Three years later, in January of 1929, the 7.8 mile tunnel was complete. It was the longest in the Western Hemisphere until 1989. In the words of a Great Northern official at the opening ceremony, "the weakest link in our transportation chain has been replaced by one of the strongest."

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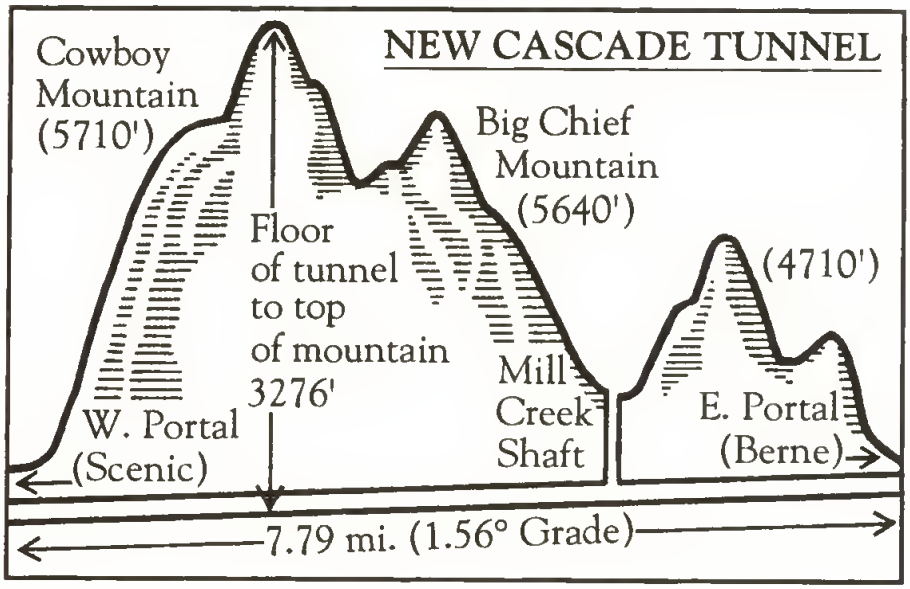
NBC radio broadcast the opening ceremonies into the homes of millions of Americans over a network of 37 stations. President-elect Herbert Hoover spoke from Washington D.C. His participation reflected the significance of the tunnel and of railroads to the nation.



Great Northern's Legacy

Washington's governor, Roland Hartley, spoke at the opening ceremonies for the second Cascade Tunnel: "The people of this Northwest Empire owe a lasting debt of gratitude to James J. Hill and those who have followed him in conducting the affairs of the Great Northern Railway."

Skeptics had dubbed Hill's idea of a transcontinental line to be built without land grants as "Hill's folly." Perhaps it would have been folly if Hill were just a railroad builder.

Hill understood that the Great Northern Railway couldn't prosper unless the territories through which it passed were settled, and commerce thrived. Railway construction was paralleled by efforts to entice settlers and create business.

Special Collections, U of W Libraries - Pickett #4211

Hill's efforts were far reaching. The Great Northern land agents in Europe lured settlers to America. Hill brought Asian industrialists to the United States to discuss trade.

In Washington state, Hill won support for the Great Northern among Seattle's leaders. He also directly promoted business, focusing on the agriculture and timber industries.

The Great Northern spurred agricultural development such as by buying bonds in the Wenatchee Development Company, which created prime orchard land through a vast irrigation project. Hill offered free mill sites and low freight rates for timber. The timber giant Frederick Weyerhauser was one of those enticed to the Northwest through Hill's offers.

Special Collections, U of W Libraries - #9283

In the 'Story of the American Railroads,' the historian Stewart Holbrook says of James J. Hill, "I can think of no other single American

who had quite so much influence on quite so large a region."

Those Who Built the Great Northern

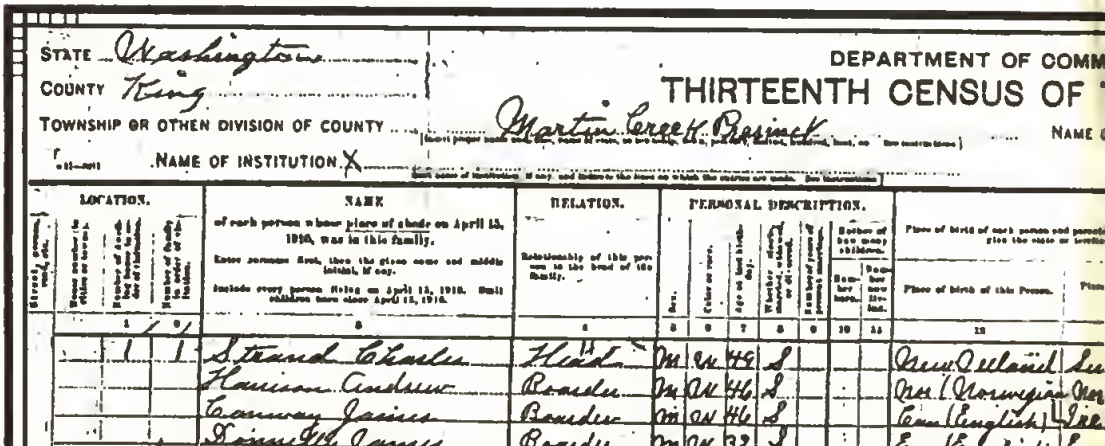
Hill's vision and skillful engineers were essential to the Great Northern's success. But the railway wouldn't have been possible without the thousands of workers whose back-breaking labor turned Hill's vision and engineers' blueprints into laid rails, completed tunnels, and smoothly operating lines.

When workers laid the first rails across the Cascades, there were no roads in that rugged wilderness. When work began, the men hauled tools on their own backs. Work continued through the cold, wet winter months where an annual snowfall of around 50 feet meant a constant battle to keep the way clear.

To build the tunnel that replaced those initial switchbacks, hardrock miners bored through rock with hand tools and air compressor-powered drills, while water seeped from the tunnel walls. The monthly turnover among the 600 to 800 person tunnel-construction crew averaged 300 to 400 men, a testament to the work's grueling nature. Most of the time replacements could be found, but labor shortages during installation of the tunnel's concrete lining caused delays.

Snowshed construction was also hard work. In 1913, 1,800 workers constructed improvements along just eight miles of track.

Workers typically toiled 10-hour days, six days a week for low wages ($1.05/day in 1900). They slept in crude housing that included bunkhouses, boxcars on sidings, cabins, and tents. Some lived at the construction site, while others stayed in towns or camps down the mountain and rode the train to work.



STATE Washington
COUNTY King
TOWNSHIP OR OTHER DIVISION OF COUNTY Martin Creek Precinct
NAME OF INSTITUTION X

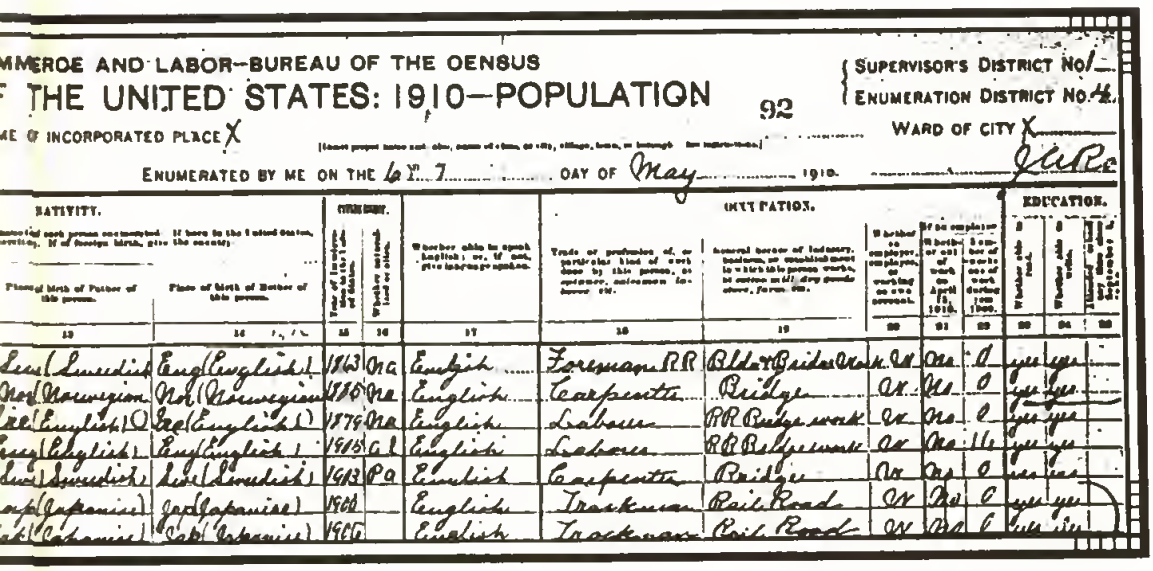
DEPARTMENT OF COMM
THIRTEENTH CENSUS OF

LOCATION.	NAME of each person whose place of abode on April 15, 1910, was in this family.	RELATION.	PERSONAL DESCRIPTION.							Place of birth of each person and parents
			Sex.	Color or race.	Age at last birthday.	Whether single, married, widowed, or divorced.	Number of years of present marriage.	Number of these children born to this mother.	Number of these children living at this date.	Place of birth of this Person.
	1	2	3	4	5	6	7	8	9	10
1	Strand Charles	Head	M	W	46	S				Germany Holland
	Hanson Andrew	Boarder	M	W	46	S				Nor (Norwegian) Nor
	Cannon James	Boarder	M	W	46	S				Ten (English) Ire
	Kinnick James	Boarder	M	W	32	S				Eng (English) Eng
	Hoskins Otter	Boarder	M	W	29	S				Swed Swedish Swe
16	Takano Yoshi	Head X	M	Jap	36	S				Jap (Japanese) Jap
	Nakamura Tomiji	Partner	M	Jap	36	S				Jap (Japanese) Jap

The Great Northern's construction and maintenance needs affected the size and nature of the work force. So did events far beyond the Great Northern's control.

For instance, the Chinese Exclusion Act of 1882 restricted Chinese immigration. That caused a sharp reduction in the availability of Chinese labor, which had been important in the construction of earlier western railroads. It appears that just a few Chinese were among the initial construction crew of the Great Northern's Cascade crossing. One story tells of Chinese workers being hastily removed from a construction camp after anti-Chinese sentiment was inflamed.

After the Chinese Exclusion Act, American businesses turned elsewhere for cheap labor, including Japan. Japanese labor contractors served as go-between; they recruited workers from Japan and oversaw their labor in


MMERCE AND LABOR—BUREAU OF THE CENSUS
F THE UNITED STATES: 1910—POPULATION 92
SUPERVISOR'S DISTRICT No.
ENUMERATION DISTRICT No. 41
ME OF INCORPORATED PLACE X
WARD OF CITY X
ENUMERATED BY ME ON THE 6th DAY OF May 1910.
NATIVITY.
OCCUPATION.
EDUCATION.
Trade or profession of, or particular kind of work done by this person, as spinner, salesman, bookkeeper, etc.
General nature of industry, business, or establishment in which this person works, as cotton mill, dry goods store, farm, etc.
Foreman RR
Carpenter
Laborer
Laborer
Carpenter
Trackman
Trackman
Bridge
Bridge
RR Bridge work
RR Bridge work
Bridge
Rail Road
Rail Road

exchange for a commission taken from each worker's pay. In 1898, the Oriental Trading Company, a Seattle-based Japanese labor contractor, began contracting with the Great Northern.

Hard times in Europe also affected the work force. Europeans came to America in search of a better life, creating another source of labor.

Census records from the Stevens Pass Area from 1900 and 1910 show a population of diverse national origins. For instance, the 1910 census for Martin Creek/Skykomish lists railway laborers from Finland, Japan, Sweden, Canada, and England, and to a lesser extent, from Germany, Norway, Scotland, Denmark, Austria, France, Russia, Italy, Switzerland, and China. They also came from within the United States, especially from New York, Illinois, Minnesota, Pennsylvania, and Iowa.

The experiences of Japanese American workers are better documented than most. Yoshiichi Tanaka, a worker on the Great Northern's Cascade Division from 1912 to around 1918, describes what his life was like:

> We laid new rails, changed ties, did leveling and adjusting, and took care of emergencies... even if it was midnight in the coldest part of winter, if there was an emergency we had to rush to the scene and make temporary repairs.

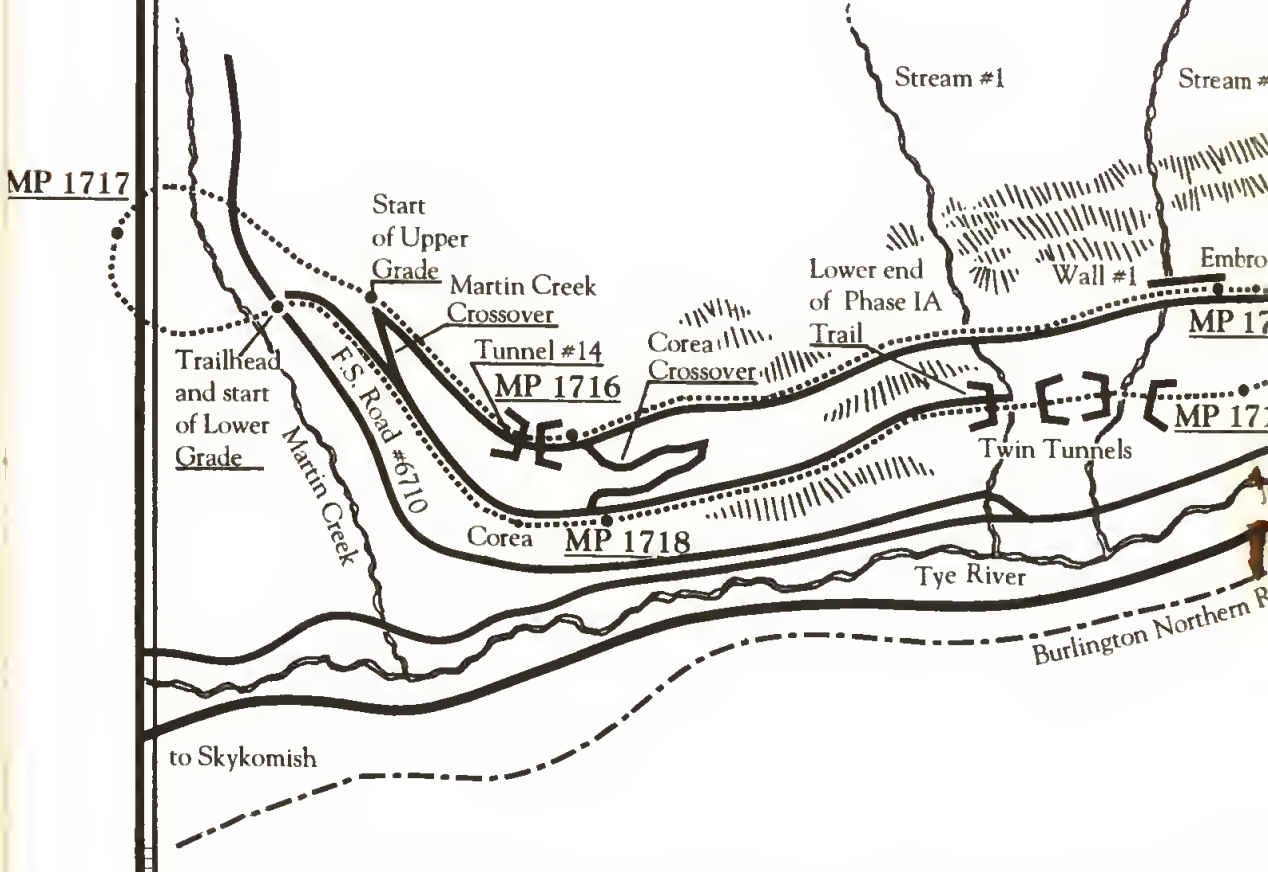
...lodging facilities were awfully poor. Two rows of beds made of boards were run along the inside walls of old freight cars. Instead of mattresses, we spread straw on the boards...Innumerable bedbugs marched all over us...

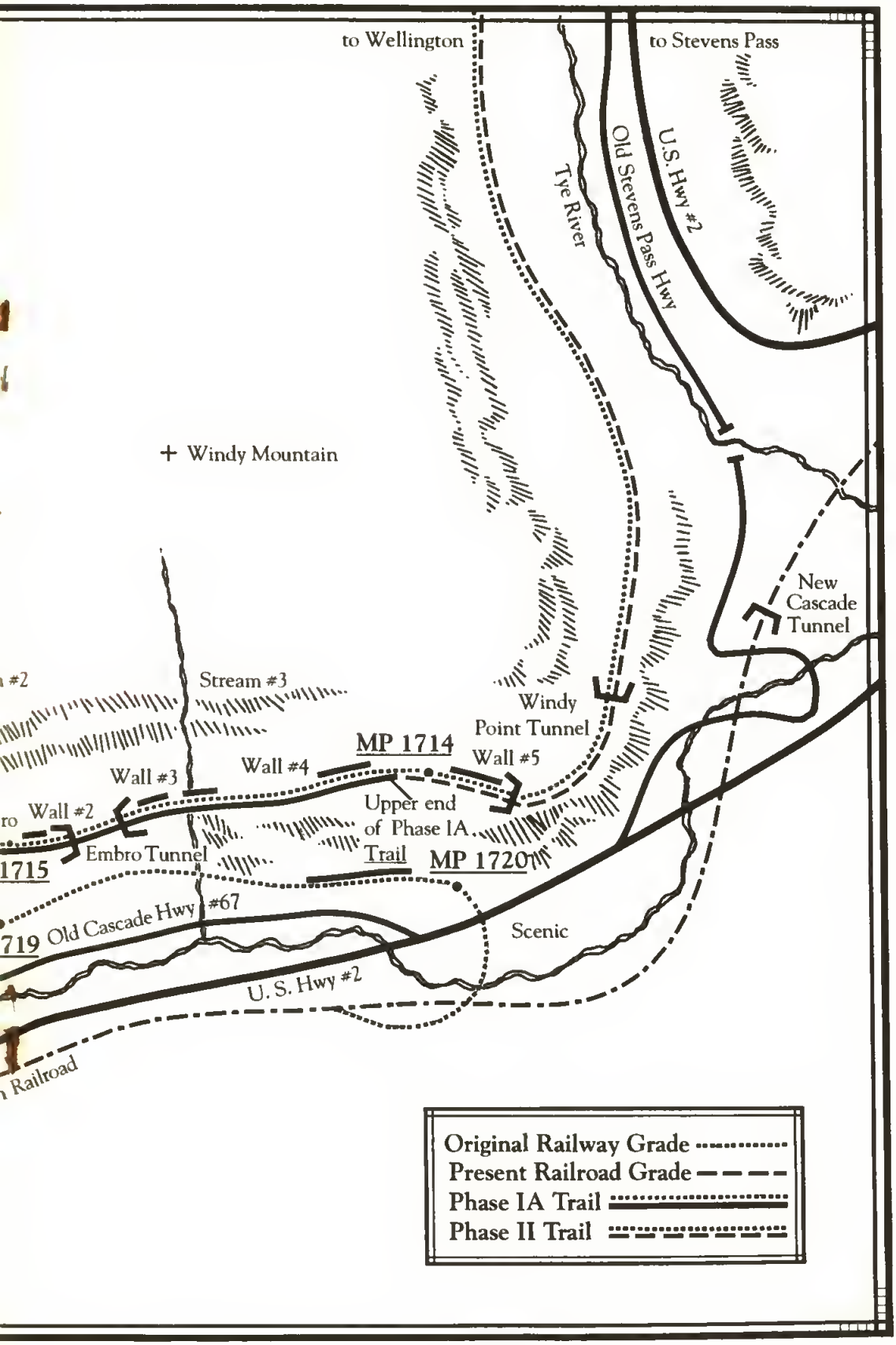
Source: Ito, Kazuo, ISSEI : A History of Japanese Immigrants in North America.

Special Collections, U of W Libraries - Pickett #4176

Such recollections help us understand another side of history. The U.S.D.A. Forest Service is seeking to find out more about those whose hard work built the railway and kept it running. If you have any information, contact the Skykomish Ranger District (206 677-2414 or 206 744-3260), Mt. Baker-Snoqualmie National Forest Supervisor's Office (206 775-9702), or the Outdoor Recreation Information Center (ORIC, 206 220-7450).

IRON GOAT TRAIL




to Wellington
to Stevens Pass
Tye River
Old Stevens Pass Hwy
U.S. Hwy #2
+ Windy Mountain
New Cascade Tunnel
Stream #3
Windy Point Tunnel
MP 1714
Wall #3
Wall #4
Wall #5
Upper end of Phase IA Trail
Wall #2
Embro Tunnel
MP 1720
#67
Old Cascade Hwy
Scenic
U. S. Hwy #2
Original Railway Grade
Present Railroad Grade
Phase IA Trail
Phase II Trail

THE TRAIL TODAY

Glen Katzenberger

As you walk the trail today, you'll see remnants from the 36 years when it was a vital link in the railway line. When this route was abandoned, the Great Northern salvaged much of the railway infrastructure, such as rails, ties, and snowshed timbers, for use elsewhere on the railway. But bits and pieces remain, challenging the imagination to complete the scene.

The views along the trail continue to change. Compare what you see with the historic photos in this guide. See how the trees and other plants have recovered and reclaimed this hillside.

Visit the trail at different times of the year to witness seasonal changes such as new spring growth and fall colors. If you are considering a winter visit, be sure to check the avalanche conditions.

Remember to stay on the trail, out of the tunnels, and off the old timbers which are prone to collapse. Take nothing but pictures and leave nothing but footprints.

Points of Interest

This section of the guidebook describes points of interest, keyed to the map (pp. 30-31), in the following order: from the trailhead to the east end of the Lower Grade, up the Corea Crossover, from the east to the west end of the

Upper Grade, and then down the Martin Creek Crossover back to the trailhead.

Milepost (MP) 1717.43

Trailhead

MP 1717.58

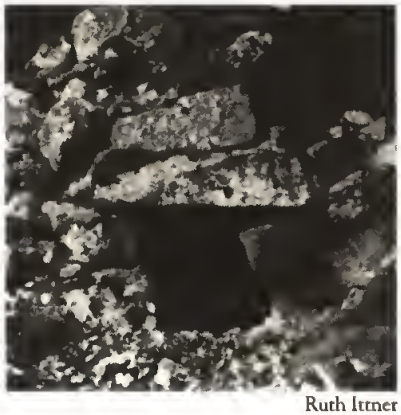
Lower end, Martin Creek Crossover: This connects to the Upper Grade. Continue along the Lower Grade if you want to follow the route as described in this guidebook.

MP 1717.60

Snowshed terraces: This rocky slope between the Upper and Lower grades is all that's left of a snowshed foundation system.

MP 1717.81

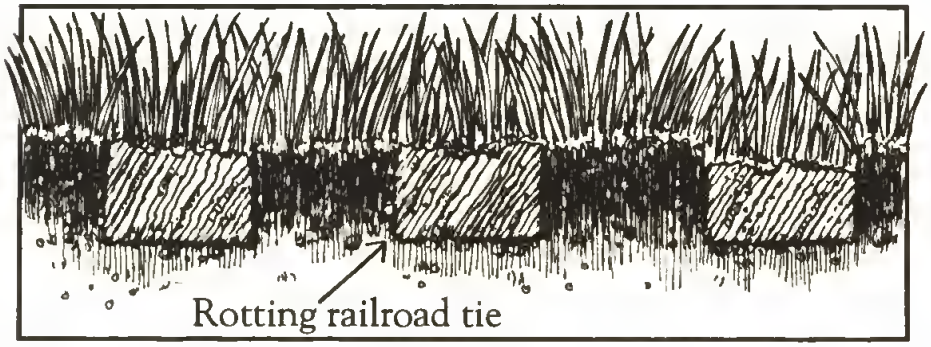
Where Corea once stood: This level, relatively un-wooded area once held a train depot and structures that housed workers. It was known as Corea, and the basis for that name remains a mystery.



Ruth Ittner

Nearby, archaeologists found fragments of two small ceramic bowls used by Japanese workers. They also found remnants of two dome ovens, one of rock and one of rock and brick, the type used by Italian and possibly other ethnic railway workers to bake bread. You can see a dome oven, commonly found along railroad construction sites, by visiting "Bygone Byways," described in Appendix C.

The railway workers are long gone, but life and change here continues. Look for vertical claw marks in evergreen trees; in early spring, bears scrape trees to obtain the nourishing cambium layer between the bark and wood.



MP 1717.85

Corrugation: Notice the corrugated surface of the moss-covered ground. The depressions are caused from railway ties that weren't salvaged but instead were left to rot in place.

MP 1717.94

Lower end, Corea Crossover: The Corea Crossover connects to the Upper Grade. For now, keep going on the Lower Grade if you want to follow the route as described in this guidebook.

MP 1718

Milepost 1718: This milepost, recreated in the style used by the Great Northern, shows you that it is 1718 miles from St. Paul along the railway line. The Great Northern measured distance from St. Paul, The railway's headquarters.

MP 1718.19

Distant peaks: When the weather is clear, you can see 6,724 foot-high Cathedral Rock, located 12 miles away in the Alpine Lakes Wilderness Area.

MP 1718.32 (Viewpoint)

Signs of the times: This scenic vista includes power lines, logged hills, a state highway, railroad tracks, and other signs of human activity. You can hear and see Highway 2 in the distance and, if you time it right, a train will rumble by. Those who have listened often to the passing trains can tell from the sound

whether a train is traveling up or down grade.

Look south from the trail for a view up Deception Creek Valley, at the foot of which is the spectacular Deception Falls.

DOT report

The railroad continues to influence the land. In 1992, blazing slag from a grinder used to smooth the rails set fire to the nearby brush. The fire quickly spread uphill, burning 257 acres of forest before fire fighters stopped the blaze within feet of the Alpine Lakes Wilderness Area.

MP 1718.36

Rock cut: The Great Northern used dynamite to blast this cut through a rock outcropping to lay its tracks. Look for a remnant of a hand-

drilled bore where explosives were placed along the inside wall. The rock cut created a gentle canyon that blocks noise.

MP 1718.51 (Viewpoint)

Twin Tunnels: Railway workers built this tunnel and its nearby twin in 1916. The twin tunnels were among the improvements prompted by the winter of 1915-16, the harshest the Great Northern had experienced.

As with some other tunnels, this was lined with timber to keep rocks from falling onto the tracks or passing trains.

Glen Katzenberger

The concrete arch before the tunnel served as a permanent snowshed to carry any sliding snow across the tracks. Drains protruding from the arch walls carry away seeping water that would otherwise build up pressure behind the walls.

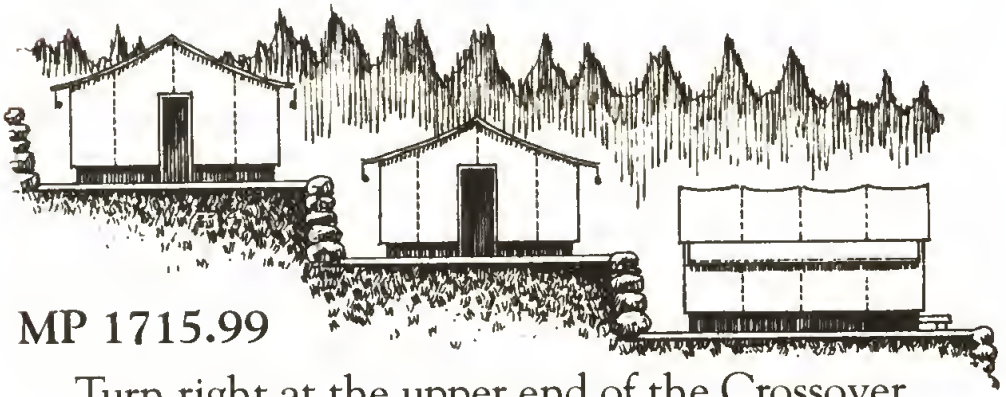
Stay out of the tunnel. Rotting timbers and falling rock make it unsafe.

MP 1718.56 (Viewpoint)

Debris flow: In 1990, a torrent of earth, water, trees, rocks, and mud roared down the hill at 20 to 50 miles per hour. The debris flow washed out a section of the Upper Grade, Lower Grade, Forest Service Road #6710, and the Old Cascade Highway, and left the scar and jumble of rocks you see here.

This marks the end of the current phase of the Lower Grade.

Corea Crossover: If you hike up the Corea Crossover (MP 1717.94), leading to the Upper Grade, notice the flat areas. At one time, railway laborers lived in tents pitched on these terraces. Such crude housing was common for those who toiled 10 hours a day to maintain the line or build snowsheds and other improvements.



MP 1715.99

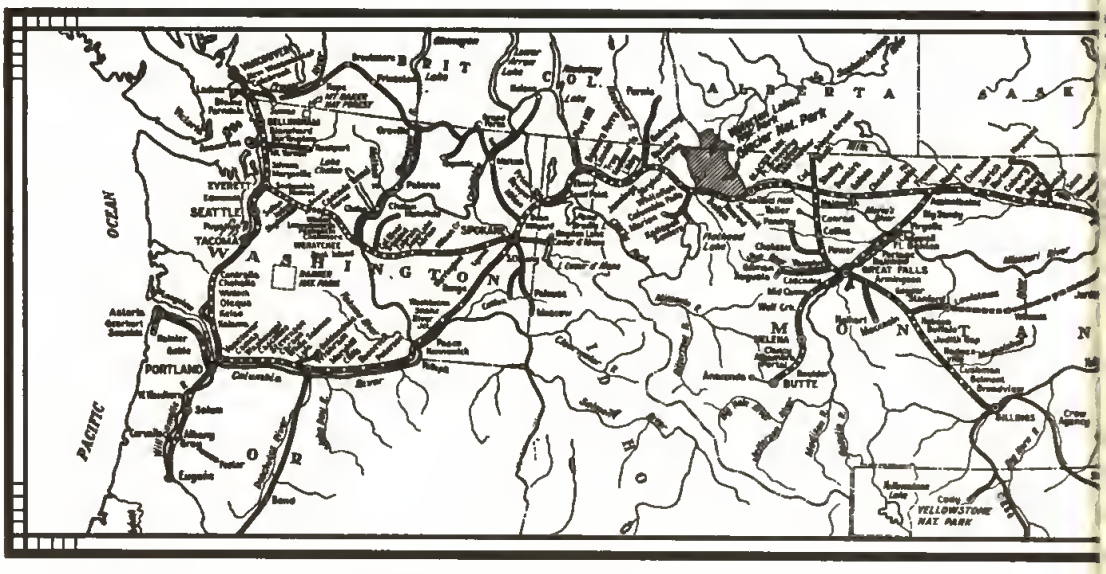
Turn right at the upper end of the Crossover and proceed to the end of the Upper Grade if you want to follow the entire route as described in the guidebook. Points of interest on the Upper Grade are described from the east end of the trail back to the Martin Creek Crossover.

MP 1714.12 (End of trail)

Concrete walls: Between the end of the Upper Grade and milepost 1715.08 you'll notice five huge concrete walls. These walls—30 feet high, 15 feet thick at the base, and as long as 540 feet—are all that remain of a series of combination timber and concrete snowsheds.

MP 1714.77 (Spur trail and Viewpoint)

Embro tunnel: This timber-lined tunnel, built in the early 1900s, is extremely unsafe. Stay out of it.



MP 1714.93

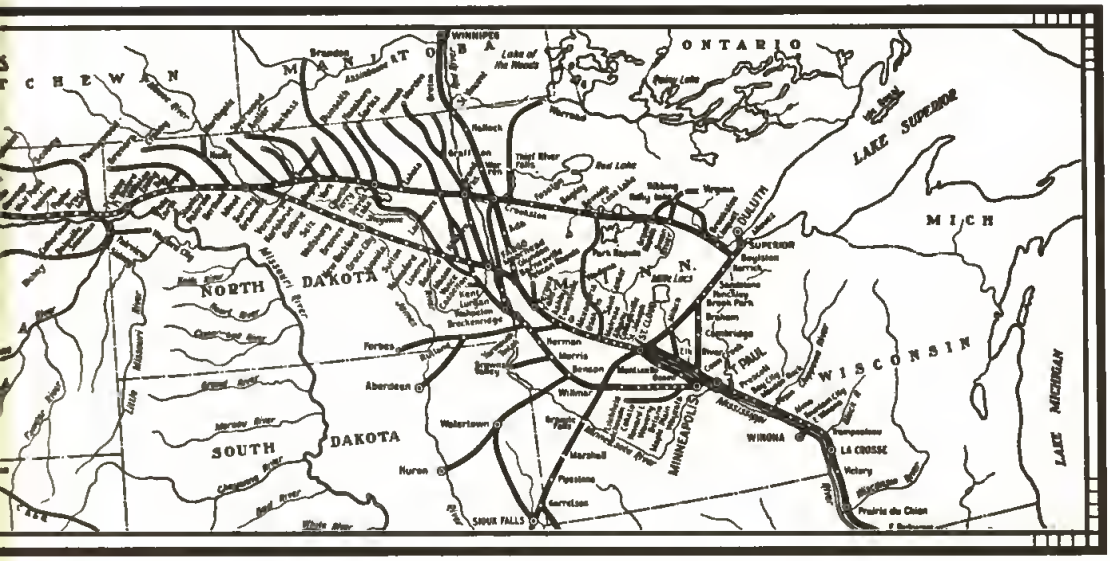
Embro: A railway station once stood here. The site was first known as Alvin, then was renamed Embro in 1914. Workers lived here, but Embro was never a bustling railway station like Wellington. Use of the station area ebbed and flowed until 1929 when the line was abandoned and most railway materials were hauled off for salvage.

MP 1715

Milepost 1715: You're now 1715 miles from St. Paul. If you traveled here from St. Paul by a Great Northern passenger train in 1893, it would have taken you about two and a half days, assuming no delays.

MP 1715.21

Support structures: From the spur trail you can see the rock wall built by the Great Northern to support the railway grade. Rock culverts were installed to dissipate water that flowed



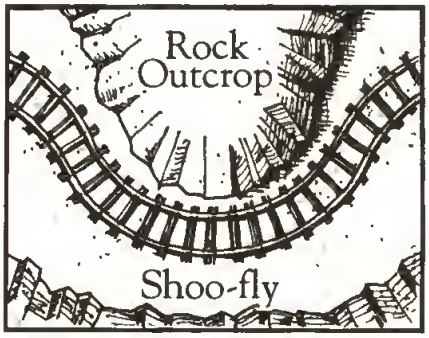
through the site. On the other side of the spur trail you can see what's left of timber cribbing that supported the downhill side of a snowshed. While the railway was operating, the snowshed kept debris out of the drainage system.

MP 1715.99

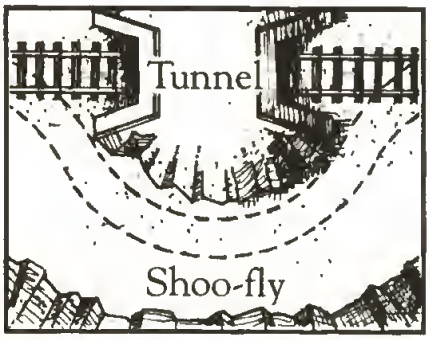
Upper end, Corea Crossover: If you're following the route as described in this guidebook, you'll now pass the upper end of the Corea Crossover.

MP 1716

Milepost 1716: You're now 1716 miles from St. Paul. The distance is measured along the Great Northern's original route, before the Cascade tunnels were built.



Initial Alignment



Final Alignment

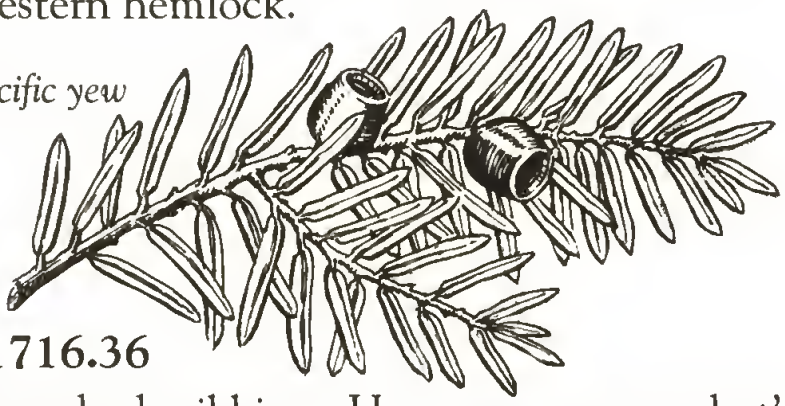
MP 1716.11 (Spur trail and Viewpoint)

Tunnel #14: The path here follows a shoo-fly, a temporary bypass used by the Great Northern. Notice the sharp curve the shoo-fly takes, and you'll understand why that route was temporary. The Great Northern built Tunnel #14 and a temporary trestle to accommodate a straighter route. The trestle was eliminated

when the gully it crossed was filled with rock blasted and hauled from the nearby tunnel. This tunnel appears on an 1894 map, showing that it was built soon after the Great Northern crossed the Cascades.

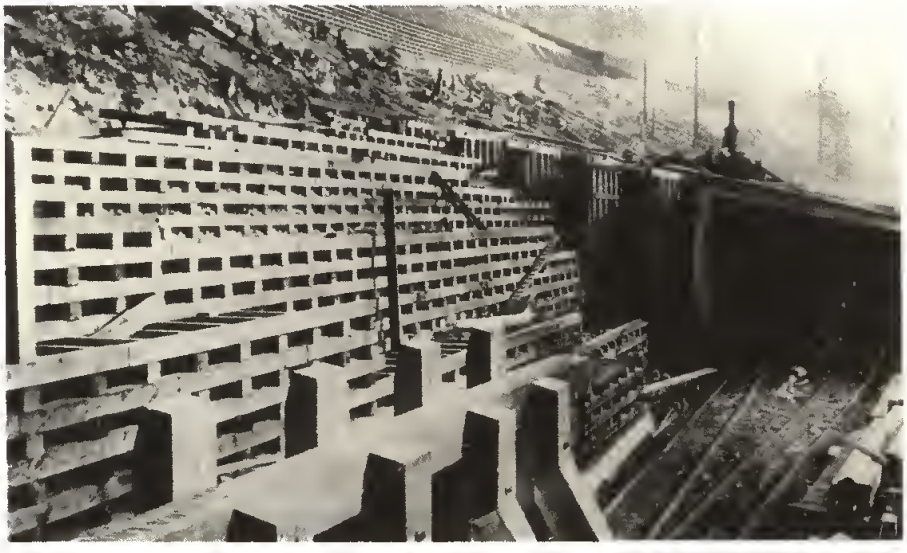
Today, a variety of plants are found near the entrance of Tunnel 14, including seven in the orchid family and several evergreen trees, including Pacific silver fir, Pacific yew, and Western hemlock.

Pacific yew



MP 1716.36

Snowshed cribbing: Here you can see what's left of rock-filled timber cribbing that held back the earth and stabilized the uphill wall of a snowshed. By 1916, after the harsh



1915-16 winter prompted the Great Northern to build yet more snowsheds, snowsheds protected virtually the entire distance between Embro and Corea. After this route was replaced, most metal and timbers were removed for salvage.

MP 1716.40

Martin Creek Crossover: This crossover connects the Upper and Lower grades. In railroad terms, a crossover is a route from one railroad track to another. During railway construction and later salvage operations, Great Northern workers hauled materials along this crossover.

When trains traveled from one grade to another, they did so via a unique engineering solution. Slightly north of today's trailhead,

eastbound trains would cross a 160 foot-high and 820 foot-long trestle over Martin Creek, enter a horseshoe shaped tunnel where they would make a 170 degree turn, then cross a shorter trestle (65 feet high and 318 feet long) back over Martin Creek on the Upper Grade. This unique solution was needed to maintain a 2.2 percent grade between Scenic and Wellington.

Both tunnel entrances have completely collapsed, and milepost 1717 lies within the collapsed tunnel. Abutments and some footings are all that's left of the trestles.

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THE TRAIL TOMORROW

Mike Hall

The USDA Forest Service and Volunteers for Outdoor Washington are working together to extend the Upper Grade to Wellington by 1995 and then eventually over Stevens Pass. Likewise, the Lower Grade will be extended to a trailhead at Scenic, depending on acquisition of private land.

Donated labor, material, and money are needed for trail construction. If you'd like to help, contact:

* Volunteers for Outdoor Washington
  4516 University Way N.E.
  Seattle, WA 98105-4511
  (206) 545-4868

* Skykomish Ranger District,
  USDA Forest Service
  P.O. Box 305
  Skykomish WA 98288
  (206) 677-2414 or (206) 744-3260

* Supervisor's Office
  Mount Baker-Snoqualmie National Forest
  USDA Forest Service
  21905 64th Avenue West
  Mountlake Terrace, WA 98043-2278
  (206) 775-9702

APPENDICES

Ruth Ittner

Appendix A: Plant List

Evergreen Trees

Douglas-fir (*Pseudotsuga menziesii*)
Hemlock, mountain (*Tsuga mertensiana*)
Hemlock, western (*Tsuga heterophylla*)
Noble fir (*Abies procera*)
Pacific silver fir (*Abies amabilis*)
Western or Pacific yew (*Taxus brevifolia*)
Western red cedar (*Thuja plicata*)

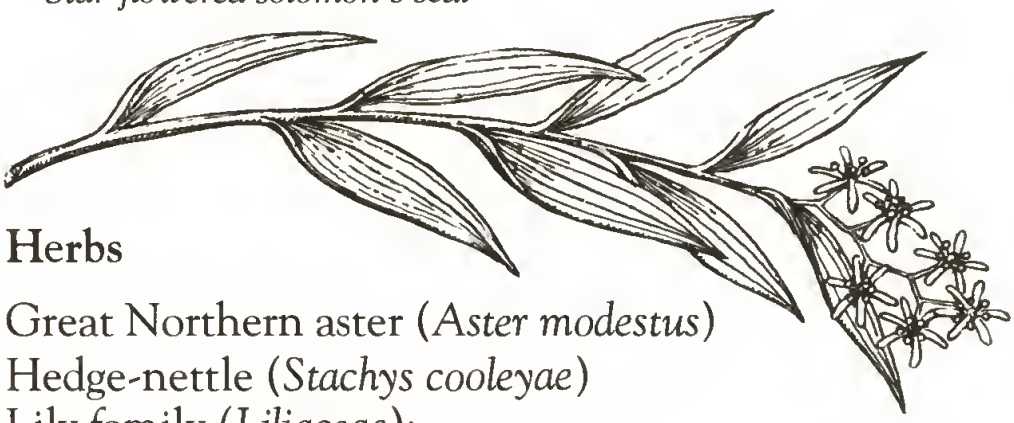
Deciduous Trees

Black cottonwood (*Populus trichocarpa*)
Red alder (*Alnus rubra*)
Sitka alder (*Alnus sinuata*)
Big-leaf maple (*Acer macrophyllum*)
Douglas maple (*Acer douglasii*)
Vine maple (*Acer circinatum*)

Shrubs

Devil's club (*Oplopanax horridum*)
Ocean-spray (*Holodiscus discolor*)
Oregon boxwood, mountain-lover (*Paxistima myrsinites*)
Red elderberry (*Sambucus racemosa*)
Red-flowering currant (*Ribes sanguineum*)
Red huckleberry (*Vaccinium parvifolium*)
Salmonberry (*Rubus spectabilis*)
Slender wintergreen (*Gaultheria ovatifolia*)
Twinflower (*Linnaea borealis*) (sub-shrub)

Star-flowered solomon's seal



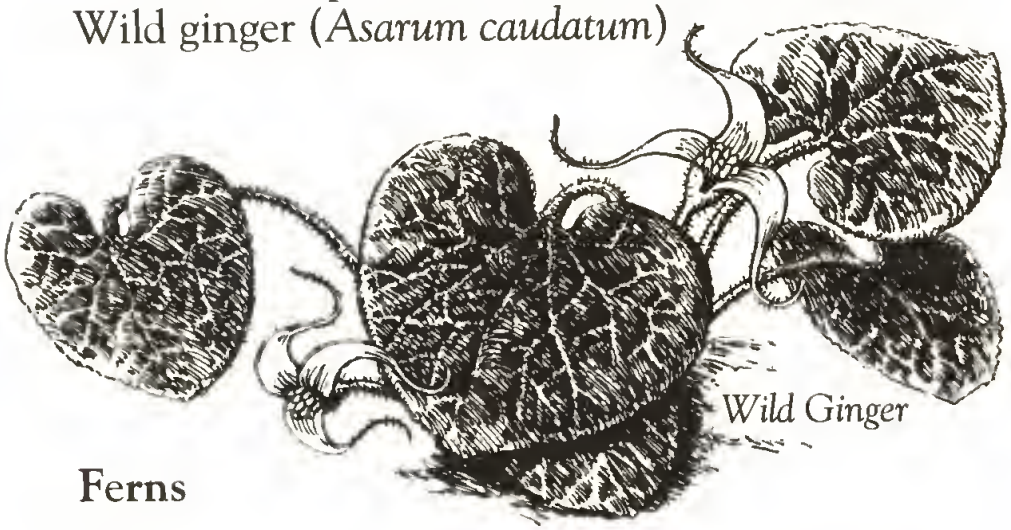
Herbs

Great Northern aster (*Aster modestus*)
Hedge-nettle (*Stachys cooleyae*)
Lily family (*Liliaceae*):
- Bronze bells, western stenanthium (*Stenanthium occidentale*)
- Clasping-leaved twisted-stalk (*Streptopus amplexifolius*)
- Columbia lily (*Lilium columbianum*)
- Oregon fairy-bells (*Disporum hookeri*)
- Star-flowered solomon's seal (*Smilacina stellata*)
- Western trillium (*Trillium ovatum*)

Orchid family (*Orchidaceae*):
- Calypso, fairy slipper (*Calypso bulbosa*)
- Coral-root, spotted (*Corallorhiza maculata*)
- Coral-root, yellow (*Corallorhiza trifida*)
- Rattlesnake-plantain (*Goodyera oblongifolia*)
- Slender bog-orchid (*Platanthera stricta*, formerly *Habenaria saccata*)
- Twayblade, heart-leafed (*Listera cordata*)
- Twayblade, northwest (*Listera caurina*)

Saxifrage family (*Saxifragaceae*):
- Foamflower (*Tiarella trifoliata*)
- Fringecup (*Tellima grandiflorum*)
- Pig-a-back plant, thousand mothers (*Tolmiea menziesii*)

Siberian miner's lettuce (*Montia sibirica*)
Sitka columbine (*Aquilegia formosa*)
Skunk cabbage (*Lysichiton americanum*)
Snapdragon family (*Scrophulariaceae*):
    Yellow monkey-flower (*Mimulus guttatus*)
    Cascade penstemon (*Penstemon serrulatus*)
Stinging nettles (*Urtica dioica*)
Violet family (*Violaceae*):
    Evergreen violet (*Viola sempervirens*)
    Stream or pioneer violet (*Viola glabella*)
Wild ginger (*Asarum caudatum*)



Wild Ginger

Ferns

Leathery grape-fern (*Botrychium multifidum*)
Virginia grape-fern (*Botrychium virginianum*)
Bracken (*Pteridium aquilinum*)
Deer-fern (*Blechnum spicant*)
Lady-fern (*Athyrium filix-femina*)
Licorice-fern (*Polypodium glycyrrhiza*)
Northern maidenhair (*Adiantum pedatum*)
Parsley-fern (*Cryptogramma crispa*)
Sword-fern (*Polystichum munitum*)

This list was provided by members of the Washington Native Plant Society.

Appendix B: Bird List

A space between listed birds indicates a new family.

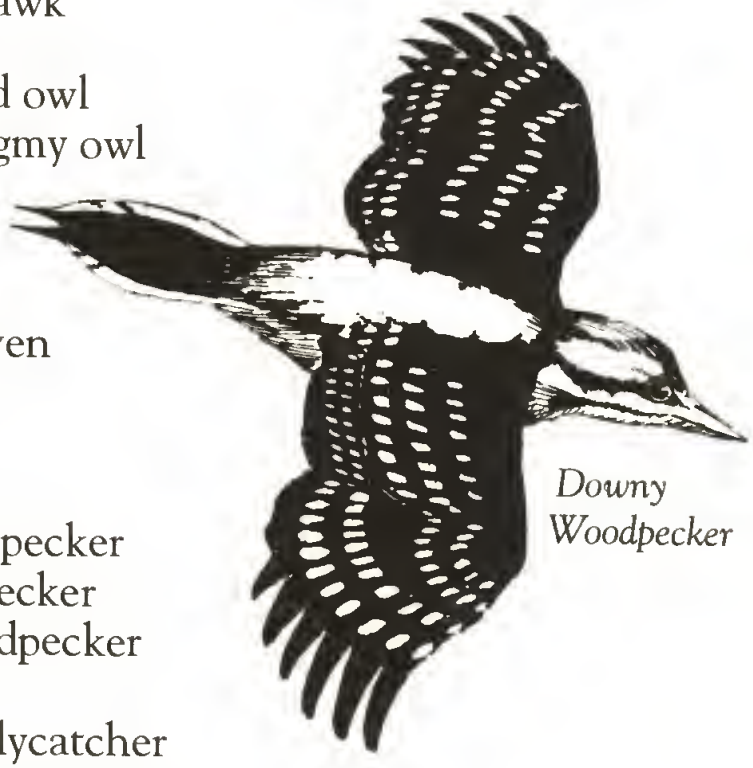
Red-tailed hawk

Great horned owl
Northern pygmy owl
Barred owl

Stellar's jay
Common raven

Vaux's swift

Downy woodpecker
Hairy woodpecker
Pileated woodpecker



Downy Woodpecker

Olive-sided flycatcher
Western wood-pewee
Hammond's flycatcher
Pacific-slope flycatcher

Black-capped chickadee
Chestnut-backed chickadee

Red-breasted nuthatch

Brown creeper

Winter wren

Golden-crowned kinglet
Swainson's thrush
Hermit thrush
American robin
Varied thrush

Cedar waxwing

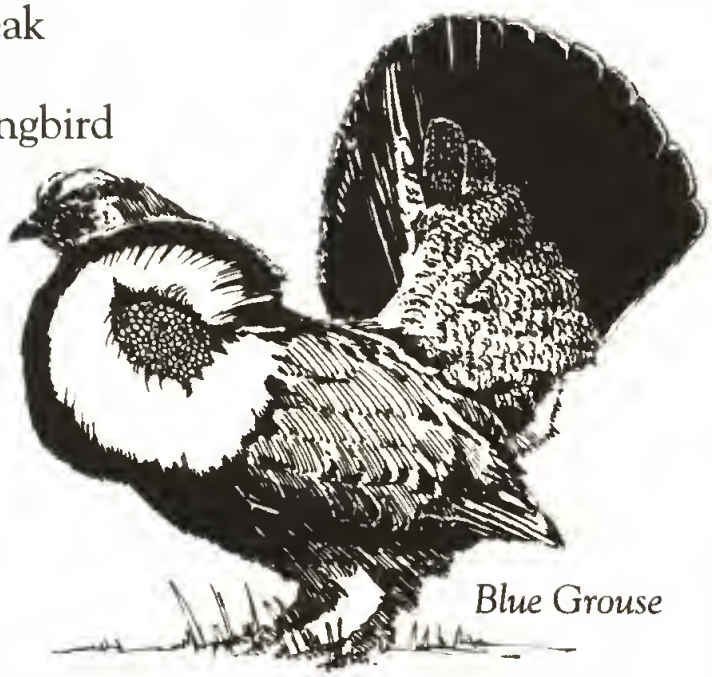
Warbling vireo

Black-throated gray warbler
Townsend's warbler
MacGillivray's warbler
Wilson's warbler
Western tanager
Dark-eyed junco

Pine siskin
Evening grosbeak

Rufous hummingbird

Blue grouse



Blue Grouse

This list was provided by members of the Seattle Audubon Society.

Appendix C: Nearby Places of Interest

The Iron Goat Trail lies within the Stevens Pass Historic District, an area of about 13 square miles from the Martin Creek Tunnel on the west to the eastern portal of the second Cascade Tunnel on the east. The District and adjacent areas are rich in recreational and interpretive opportunities, including:

* Railroad Avenue District in the town of Skykomish. Railroad Avenue contains early twentieth century buildings representing the commercial development that followed railway construction. Skykomish served as a division point for the Great Northern.

* Deception Falls Picnic area and nature trail. Experience scenic old growth stands and marvelous views of Deception Creek while learning some of its secrets. Picnic tables, a picnic shelter, and a toilet are part of this recently re-constructed facility.

* Stevens Pass Ski Area. This alpine ski area off Route 2 at the Stevens Pass summit includes nine chair lifts plus a day lodge and other amenities.

Gary Paull

* Mill Creek Nordic Ski area. This cross-country ski area is located east of the Stevens Pass summit along Route 2.

* Bygone Byways. This short interpretive trail along Route 2 on the east side of Stevens Pass describes several abandoned transportation routes and displays a bread oven used by Italian railway construction workers.

* Tumwater Dam. Tumwater dam was completed in 1909 to provide power for electric locomotives to travel through the first Cascade Tunnel and eliminate the hazards from coal-burning exhaust. Eventually, the entire route between Skykomish and Appleyard was electrified. In 1956, the railroad converted to diesel, and the Tumwater Hydroelectric Project was closed. The powerhouse and related generating facilities were subsequently removed, but the dam still stands, equipped with modern fish passage facilities.

* Numerous trails for hiking, cross country skiing, or snowshoeing, including the Pacific Crest National Scenic trail. For information on specific trails, call or visit the Skykomish Ranger District (206 677-2414), the Lake Wenatchee Ranger District (509 763-3103), Mt. Baker-Snoqualmie National Forest Supervisor's Office (206 775-9702), or Outdoor Recreation Information Center (ORIC, 206 220-7450).

Appendix D: Selected Readings

General History

Anderson, Eva. Rails Across the Cascades. World Publishing Co., Wenatchee, WA, 1952.

Hidy, Ralph W., and Muriel E. Hidy et al. The Great Northern Railway, A History. Harvard Business School Press, Boston, MA, 1988.

Hult, Ruby, El. Northwest Disasters. Binfords and Mort, Portland, OR, 1960.

Wood, Charles R. Lines West. Superior Publishing Company, Seattle, WA, 1967.

Wood, Charles R. and Dorothy Wood. The Great Northern Railway: A Pictorial Study. Pacific Fast Mail, Edmonds, WA 1979.

Ethnic History

Ichioka, Yuji. The Issei: The World of the First Generation Japanese Immigrants, 1885-1924. The Free Press, NY, NY. 1988

Ito, Kazuo. ISSEI: A history of Japanese Immigrants in North America. Executive Committee for publication, Japanese Community Service, Seattle, WA, 1973. English and Japanese Language Editions.

Wegars, Priscilla. "Who's Been Workin' on the Railroad?: An Examination of the Construction, Distribution, and Ethnic Origins of Domed Rock Ovens on Railroad-Related Sites." Historical Archaeology, 25(1), 37-65, 1991.

White, Thomas, W. "Race, Ethnicity, and Gender in the Railroad Work Force: The Case of the Far Northwest, 1883-1918." The Western Historical Quarterly, July 1985.

A Personal History

Haskell, Daniel C., Ed. On Reconnaissance for the Great Northern: Letters of C.F.B. Haskell, 1889-1891. New York Public Library, NY, NY, 1948.

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Dear Reader:

The production of this book would not have been possible without the support and hard work of many individuals and organizations. The countless hours devoted to this effort resulted in the quality product in your hands. So, it is to them that we owe a great deal of thanks!

Daniel T. Harkenrider

Daniel T. Harkenrider
District Ranger
Skykomish Ranger District

Designed and illustrated by James A. Engelhardt.

Written by N. Alison Tucker.

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One hundred years ago, the Great Northern Railway's first train to cross Washington's Cascade Mountains, near Stevens Pass, labored its way via a series of switchbacks that took 12 miles of track to connect points only three miles apart as the crow flies. Today, amid ghostly echoes of steam whistles and glorious views of mountain scenery, you can begin to retrace this historic route on the new Iron Goat Trail.

This trail represents a unique and imaginative combination of teamwork. Private sources, organizations and government agencies provided the funding, and volunteers provided the labor necessary to construct a modern trail through fallen timber and avalanche debris. The first four-mile section was ready for dedication in 1993, including a wide, nearly level 1.2-mile stretch that is barrier free. Two remaining four-mile sections are to be completed by the turn of the century.

This guidebook will enrich your travel along the Iron Goat Trail with a capsule history of the building of the Great Northern through the pass, as well as of the famous 7.8 mile tunnel that later caused the section that is now trail to be abandoned. You'll also find maps and descriptions of points of interest along the trail, both historic and scenic, as well as lists of plants and birds commonly seen in the area. Come walk the route of the Iron Goat, and marvel at the efforts of the rail pioneers of yesteryear - and the trail pioneers of today!

Volunteers for Outdoor Washington

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